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Case Report

EPIDURAL MASS DUE TO *ASPERGILLUS FLAVUS* CAUSING SPINAL CORD COMPRESSION - A CASE REPORT AND BRIEF UPDATE

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Abstract

Aspergillus infection of the central nervous system (CNS) is an uncommon disease. Most of the reported cases are of sinocranial spread and cases with contiguous spread to spinal cord from lung and other organs are uncommon. A case of pulmonary aspergillosis with extension to thoracic vertebrae forming a paraspinal mass resulting in neurological deficit due to *Aspergillus flavus*, is reported. The 43 year old patient did not have any obvious predisposing condition. He presented with loss of motor function and succumbed to the infection despite operative intervention and antifungal therapy. A brief update on CNS aspergillosis is presented along with detailed clinical, radiological and laboratory work up of the patient.

Key words*: CNS, aspergillosis, spinal cord, Aspergillosis flavus, vertebral column*

Aspergillus infection of the central nervous system (CNS) is considered a rare disase.[1] Recent literature, however, shows an increasing trend in the number of cases being reported.[2,3] Involvement of CNS is more commonly associated with the brain and less commonly with the spinal cord.[1] The commonest underlying conditions favouring spread to CNS include transplantation, malignancy, cytotoxic agents, chronic asthma and steroid use, AIDS, thermal burns, hepatic failure and surgical procedures. Some of the other predisposing factors reported are immunosuppression due to systemic lupus erythematous, infected aortic graft, neuroblastoma and stage IV sarcoidosis.[2-5] In India, sinocranial form of aspergillosis is the most common from of CNS aspergillosis.[3] The present case is of spinal cord compression due to aspergillosis. This case is being reported for its rarity and for a microbiological work up which is less commonly reported in such cases.

Case report

A 43 year old male was admitted in October 2001 for complaints of weakness in both hands, numbness of left thumb and a feeling of tightness in both lower limbs for a period of one month. On examination, his left hand grip was found to be weak. A 50% reduction of pain and touch sensation was found on the left side in the C6 C7 innervated areas. On the right side, a 25% reduction was seen in the same areas. On MRI, a marrow replacing lesion involving D_2 to D_5 vertebrae and paravertebral and epidurals oft tissue component was observed (Fig. 1). The MRI showed sings of infective granuloma with epidural granulation tissue compressing the spinal cord at dorsal region, with altered alignment of the spinal column at cervicodorsal region.

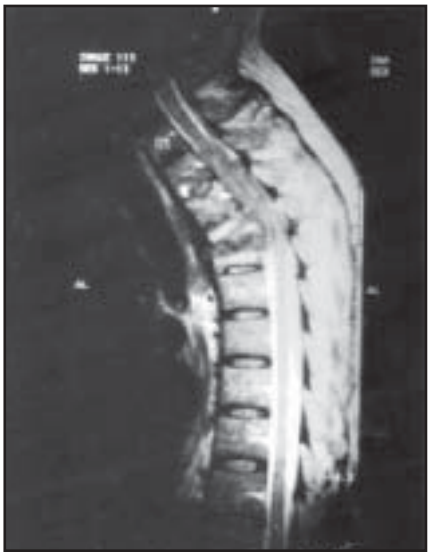

Figure 1: TZW MRI of thoracic spine shows anterior compression with disc involvement with marrow changes, atrophy and abnormal cord signal

The past history of the patient revealed that he had undergone wide excision of right apical pleural lesion and the posterior segment of the right upper lobe of the lung in June 1999 for a suspected tumour of the lung at another institute. A computerised tomography scan of thorax in March 2000 showed an airfluid space in the previously operated region with an upward and forward displacement of the right horizontal fissure with extensive fibrosis and thickening. The right middle lobe appeared to be hyperinflated. Nodular pleural thickenings with ground glass densities were seen in the subpleural lung along the costal surface of the right upper and middle lobes. A soft tissue mass was seen anteriorly around the first costal cartilage on the right side with destruction of the underlying cartilage. The posterior part of the right sided second rib was eroded with evidence of an associated soft tissue mass. A right paraspinal soft tissue mass was also seen in the same level extending down to the level

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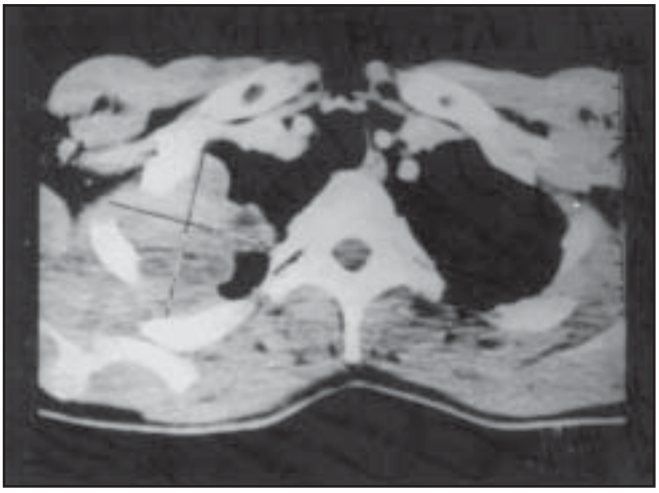

Figure 2: Axial CT section of chest shows a right paraspinal region mass with lobulated outline

of D_6 vertebra (Figure 2). The vertebrae did not appear to be involved. An X-ray of the chest had also shown evidence of a mass in the right paratracheal and suprahilar regions with a paratracheal shadow on the right side in the lower dorsal region.

A contrast enhanced CT scan was repeated in March 2001 when the patient reported to our out patient department. It indicated a right partial upper pulmonary lobectomy status in a case of a right pleural based lesion. The pleura based mass was noted in the right upper thoracic region with erosion of adjacent bones notably the right sided second to seventh ribs and right side of sternum and the right transverse process of the D_4 vertebra. A second similar lesion was noted extending from D_8 to D_{10} levels on the right side. When compared with the previous CT scan, the lesions had significantly progressed. The patient was attending another hospital at this time and the treatment details were not available with the patient.

Other investigations at that time revealed an eosinophilia with 12% eosinophils and a raised ESR of 40mm at the end of one hour. Other haematological investigations were within normal limits. Tests for HIV antibody and HBsAg were negative. The patient was admitted for laminectomy for a cord compressing lesion leading to paraplegia. In mid October the patient underwent a $D_2 - D_5$ laminectomy and excision of the epidural mass with decompression of the cord.

The excised tissue was submitted for mycological culture and histopathology. The granulation tissue sent for fungal culture was observed in 20% KOH (in our experience, 20% KOH helps better visualisation of fungi in tough tissues than 10% KOH) and Gram staining. Septate fungal hyphae wee observed in both the preparations. The tissue was cultured on Sabouraud dextrose agar, culture of which grew *Aspergillus flavus*. Histopathology of the section showed fibrocollagenous tissue and granulation tissue infiltrated by chronic inflammatory cells, few eosinophils and neurophils. Focal

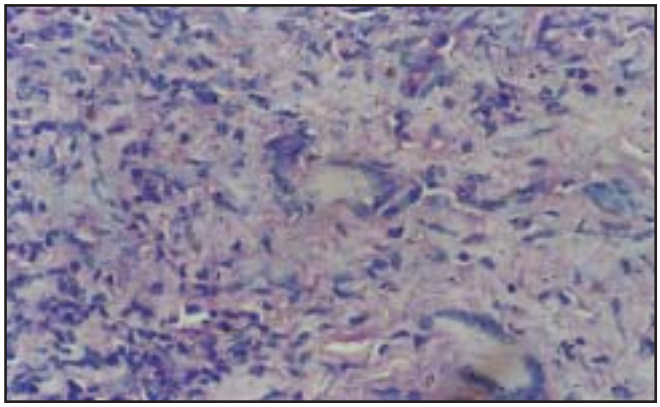

Figure 3: Histopathology of granulation tissue excised during laminectomy showing chronic inflammatory cells, necrotic areas and giant cells, some with intracellular fungal elements
H and E (x400)

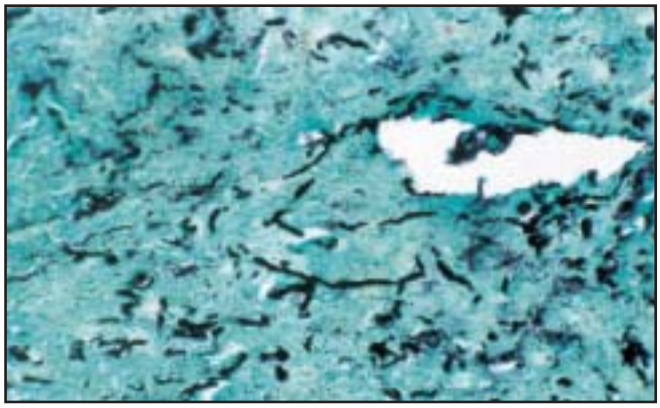

Figure 4: Fungal hyphae seen in epidural granulation tissue in GSM staining in histopathologys (x400)

areas of necrosis and a prominent giant cell reaction was seen. In the necrotic areas and in giant cells, septate fungal hyphae were seen (Figure 3). Gomori's Methenamine silver stain confirmed the presence of fungus (Figure 4).

Postoperatively, the patient improved neurologically. The power improved from grade I to III on the right side. Perioperatively the patient was put on intravenous fluconazole 400mg once a day followed by Amphotericin B. By sixth day after operation, the patient had a power of grade II in the left lower limb and a re-exploration and excision of epidural mass with Hart Sheel fixation was carried out. However sixteenth day postoperatively, the patient died.

Discussion

In many of the cases of spinal cord compression due to *Aspergillus* infection, the spread is generally from the lung.[6,7] Though contiguous spread from lungs has been reported by some workers,[7] one other report indicates that the lung was affected prior to vertebral column affection in one patient with adult T cell leukemia but there was no evidence of a contiguous extension from the lung indicating a possibility of a haematogenous spred.[6] In our case, direct extension was

probably the mode of spread. *Aspergillus* appears to have a predilection to the CNS as shown by the fact that out of the 71 patients with invasive aspergillosis studied over a period of 20 years by Kleinschmidt-Demasters,[2] only 2 cases with dissemination to three or more organs did not have spread to the CNS. The authors has reported a 49.1% incidence of CNS aspergillosis (in brain) in the 71 patients studied. Murthy *et al*[3] have reported 21 patients with aspergillosis of the brain. In 76% of these patients the spread of infection occurred from the paranasal sinuses. Predisposing factors were found only in four of the 21 patients. CNS may also be affected by direct extension from the ear.[8] only scattered reports of spinal cord compression are found in the literature, presenting as an epidural abscess or through involvement of the thoracic vertebrae. [5-7]

Chronic alcoholism, liver cirrhosis and corticosteroid treatment were identified as the predisposing factors in one patient who had an aspergilloma in a lung cyst which progressed to development of an epidural abscess.[9] In another case with sarcoidosis[5] bilateral lung aspergillomas were noted which finally led to cord compression. In our case, no obvious predisposing factor was seen.

Spinal cord involvement by Aspergillus resulting in paraplegia has been reported by some workers mostly outside India.[6,7] Sensory loss has also been noted.[1] D4-D5 level of spinal cord appears to be commonly affected by contiguous spread of the infection from lung.[6] Histopathologically, marked necrosis and haemorrhage in the spinal cord has been observed without leukemic cell infiltration in a leukemic patient.[6] Others have shown extensive granulomatous and purulent lesions in the epidural and subdural spaces, Aspergillus hyphae may penetrate the myelin sheath and result in myelomalacia.[7] Abscesses and vertebral destruction may also be seen. In our patient, histopathology in the lung showed multiple foreign body granulomas in the pleura, with fungal hyphae. Foreign body type of giant cells were also visualised. Reports on culture studies of lung lesion were not available as the patient was attending another hospital.

Aspergillus infection of CNS may be in the form of single or multiple gr4anulomata or abscesses.[3] Some authors[2] also report in their series, numerous meningeal granulomas and multinucleated giant cells in 2.3% of the 42 cases of CNS aspergillosis. In others however, the lesions ranged from subtle abscesses, haemorrhagic necrosis, focal purulent meningitis or bland infarctions. Massive spinal cord necrosis was found in one patient with adult T cell leukemia.[6]

CSF examination has been found to be of no value in the diagnosis of CNS aspergillosis.[4] definitive diagnosis depends on the demonstration of casual agents in tissue samples. Other fungi can also cause clinically and pathologically similar lesions in the CNS. These include *Pseudallescheria boydii, Scedosporium inflatum, Chaetomium* spp. etc.[2] These generally affect the brain. Culture identification of fungi causing spinal cord infection appears to be scarcely reported in literature.

Lung lesions due to *Aspergillus* frequently mimic carcinoma.[1] In the vertebral column, epidural and subdural granulomatous change with *Aspergillus* abscesses and osteomalacia is comparable to metastatic carcinoma. However, the *Aspergillus* infection in the spinal cord is more extensive and destructive.[7]

Specific treatment in the form of Amphotericin B has been found to be effective in some cases but even with intracaval doses, results have not been good.[10] Excision of the lung lesion and a decompressive laminectomy along with amphotericin B was effective in the patient reported by Sere *et al.*[1] Successful treatment with surgery and ketoconazole in a similar case with pulmonary aspergillosis and cord compression due to its extension has been reported.[11] Clinical diagnosis of cases of aspergillosis is extremely difficult and often requires specialised tissue studies. Clinical suspicion of fungal infection, surgical intervention for spinal cord decompresion, tissue biopsy and relentless diagnostic laboratory studies are often required. However, despite the development of antifungal drugs, diagnostic delays or difficulties adversely affect the prognosis of this disease.

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ANNOUNCEMENT